A new *Hakea* species (Proteaceae: Grevilleoideae) from East Gippsland, Victoria

William M. Molyneux[1]* and Susan G. Forrester[2]

[1]*La Trobe University, Department of Botany, Life Sciences School, Bundoora, Victoria 3083, Australia.
[2]200 Beachs Lane, Dixons Creek, Victoria 3775, Australia.

Abstract

A new species of *Hakea* Schrad. & J.C.Wendl. with a restricted known distribution in the Alpine National Park, East Gippsland, Victoria, *H. asperma* Molyneux & Forrester sp. nov. is described and illustrated. Its relationships with *H. lissosperma* R.Br and *H. microcarpa* R.Br are discussed and critical differences noted. The new species, while flowering freely, has not been observed to set fruit and apparently relies on ramet production for its persistence.

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Introduction

In 2001, during field studies on populations of mallee eucalypts in the Upper Buchan River district of East Gippsland, we observed a low-growing, multi-stemmed *Hakea* in association with the mallee eucalypts. While this new entity closely resembles *H. lissosperma* (which occurs in the region), the dwarf, root-suckering habit of this population represent two significant character states not recorded for *H. lissosperma* (Barker *et al.* 1996, 1999). The stem diameter at ground level of the new species *H. asperma* is ± 12–15 cm at ground level, compared with a trunk diameter of c. 140 cm in a specimen of *H. lissosperma* on the Bogong High Plains.

Hakea microcarpa R.Br. is a widespread species common in moist to wet sites such as along the upper Buchan River. Populations of this species occur within two hundred metres of *H. asperma*. *Hakea microcarpa* is a small, mostly open, much branched shrub with both terete and flattened leaves, often seen on the same plant. It has scattered silky hairs on the floral rachis and has small fruit that sheds seed upon ripening in the first year. This species is known to regenerate at the base of stems following fire or flood damage. In comparison, *H. asperma* extends by single ramet production along buried (or occasionally exposed) roots (its obligate method of population extension), has only terete leaves, a sericeous rachis, and sets no fruit.

While pollen has been observed escaping from anthers of *H. asperma*, no testing has been undertaken by the authors to ascertain its viability, nor whether any fertilisation takes place. Future DNA studies may shed light on the inability of *H. asperma* to set fruit. A further example of taxa producing pollen but not setting seed was discussed by the authors in a paper describing three new *Acacia* species from East Gippsland, to the east of the *H. asperma* population (Molyneux & Forrester 2008).

As *H. asperma* persists by ramet production, the term ramet is used throughout this paper to describe the whole above-ground entity, rather than using the potentially confusing terms 'plant' or 'stem'.

However, terms such as 'stem' or 'leaf' are used to describe those parts of the entity when relevant.

Our initial survey estimated the area occupied by the species at c. 0.15 ha, with the population comprising an estimated 1000 individual ramets. In the summer of 2002 this region was severely burnt in a localised fire, a year prior to the widespread summer fires of 2003 in this region of Victoria. The *H. asperma* population, together with the mallee eucalypts, was severely damaged. Returning to the site in May 2003, we observed some ramet production up to 10 cm high. By 2006 the *Hakea*, together with the eucalypts, had regenerated strongly and in November 2008 we collected flowering specimens of *H. asperma*. At this time we observed that the *H. asperma* population now covered c. 0.2 ha with the number of ramets estimated at 2000. Future study may indicate whether the observed extent of post-fire vegetative recruitment is maintained or limited by competition from other species.

Herbarium records reveal no collections of the taxon prior to the present study. Populations of *H. lissosperma* have been recorded by Wakefield c. 5 km to the east in the Cobberas (MEL1507364, 29.i.1949) and the authors have sighted a substantial population of this species 2-4 m tall c. 23 km south of the *H. asperma* population, south of the Diggers Hole Track on the Nunniong Plateau.

Taxonomy

Hakea asperma Molyneux & Forrester *sp. nov.*

H. lissospermae *R. Br. arcte affinis, in habitu breviore, surculis a radicibus efferentibus et absentia fructorum differt.*

Type: Victoria. Above the north side of Native Dog Falls on the Upper Buchan River, 12.xi.2008, *W.M. Molyneux and S.G. Forrester s.n.* (holo: MEL 2312606, 2328061 (multisheet); iso: AD, CANB, HO, NSW, MEL 2312607, 2328060).

An erect root-suckering *shrub* to 50(–130) cm high, persisting by ramets. *Stems* with smooth grey bark, ± 120–150 mm circumference at ground level; branchlets glabrous. *Leaves* terete (21–) 30–40 or 65–96 (–100) mm long, 0.8–1.3 mm wide, straight, rigidly mucronate, grey-green, glabrous, articulate to and at c. 10–15° to stems, new growth sericeous white, apex hairs ferruginous. *Inflorescence* conspicuously bracteose, axillary, simple. *Flowers* 6–10. *Bracts* oblong, imbricate, white-tomentose on the outer surface, 2.5–3(–4) mm long, 2–2.5 mm wide. *Rachis* 1–1.5 mm long, sericeous. *Pedicels* fine, c. 5 mm long, sparsely sericeous. *Perianth* glabrous outside (or irregularly sericeous at base), 4–4.5 mm long, c. 1 mm wide midway along its length, white, densely sericeous internally at c. midway along its length. *Anthers* yellow, pollen pale lemon. *Style* white, 7–8 mm long, often pink-tinged behind style end, which is oblique at c. 25–33° to the style; pollen presenter flat to convex, margins undulate, stigma short, c. 0.3 mm high; ovary green; nectary white, broadly U-shaped, thick. *Fruit* not produced.

Specimen examined: **VICTORIA**: Above Native Dog Falls on (upper) Buchan River, elevation 1197 m, 19.v.2003, W.M. Molyneux, MEL 2236326, 36°54'26"S 148°05'21"E.

Distribution: *Hakea asperma* is apparently endemic to the Native Dog Flat area of the Upper Buchan River district in East Gippsland, Victoria, where it is presently known from a single population of c. 2000 ramets in an area of c. 0.2 ha above and to the north of Native Dog Falls.

Conservation Status: Using the criteria of the IUCN (2001), the species is assessed as critically endangered, with a conservation code of CR D, on account of its exceedingly small population size, which may comprise no more than a single or very few genetic individuals or genets, which renders the species highly susceptible to extinction by successive fire occurrences or other stochastic events.

Habitat: *Hakea asperma* occurs on the lower slopes of a small steep hill of Devonian igneous origin where sufficient soil depth and area exists to support the root systems between broken, often buried rock. An occasional root is exposed growing over shallow rock.

Associated eucalypts include *Eucalyptus* sp. aff. *stellulata* Sieber ex DC., (an undescribed mallee with several locally endemic populations), a dwarf form of *Eucalyptus pauciflora* Sieber ex Spreng. subsp. *pauciflora*, *Eucalyptus rubida* H.Deane & Maiden and *Eucalyptus viminalis* Labill. subsp. *viminalis*. Other associated species include *Bossiaea foliosa* A.Cunn., *Daviesia latifolia* R.Br., *Daviesia ulicifolia* Andrews, *Goodenia hederacea* Sm., *Lomatia myricoides* (C.F.Gaertn.) Domin, *Persoonia confertiflora* Benth. and *Polyscias sambucifolius* (DC.) Harms.

Figure 1A. *Hakea asperma*: canflarescence; **B.** *Hakea asperma*: 54 ramets in an area of 15 square metres.

Phenology: Flowers early November to mid December.

Etymology: The specific epithet refers to the infecund nature of the species in comparison with *Hakea lissosperma* and *Hakea microcarpa*.

Recommended English name: Native Dog Hakea.

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